rock, water, leaves, the human skin, or the outside surface of the clothing. The temperature shown by an accurate thermometer is always the average temperature of its bulb, but we are ourselves liable to make a mistake in assuming that this is also the temperature of the object that we wish to measure.

It is claimed that the nocturnal minimum temperature, as recorded within a shelter, is always higher than the real minimum temperature of the air, because the shelter retains the heat that it acquired during the day, and that therefore, the minimum thermometer should be placed outside the shelter, with a mere canopy above to prevent radiation to the clear sky. But if the shelter is properly made the heat of its top and sides, warming the cold air in contact with them, will cause the latter to rise, drawing in fresh air from all sides; if this indraft is strong enough it will keep the thermometers down to the temperature of the air, if it is not strong enough it must be increased by artificial aspiration or by whirling the thermometer; therefore, the Weather Bureau shelter, like that of all other modern meteorological offices, combines ventilation with screens that shelter from noxious radiations.

We regret very much that these modern improvements are too expensive to be provided for every important voluntary station. In this respect, however, all the world is on the same plane, and observers everywhere have to content themselves with the reflection that, although the maximum temperatures may be too low and the minimum too high, yet the average temperatures of the day, the month, and the year will not be very erroneous. Meteorology and climatology have not yet attained to that development as exact sciences that they can afford to dispense with the faithful work of an honest observer, even if there be small systematic errors in his work. Of course, those who can give us some idea of the amount of these errors, in their own individual cases, will contribute by so much to the advancement of exact knowledge.

FAKE STORMS.

Mr. John F. Smith, Jr., voluntary observer at Jasper, Hamilton County, Fla., reports that no storm occurred in that neighborhood during the current month corresponding to the one described in a special telegraphic dispatch published in a Cincinnati paper of July 19. Something like Farmer Harvey's race with a tornado may have occurred at some other time and place, but as it stands the record seems to be a hoax.

Meteorology is peculiarly liable to be troubled by the inevitable errors of observers, but it is greatly to be regretted that any one, in seeking to hoax the public, should not also send the Weather Bureau at least a word of caution. We rely so implicitly on the good faith of the press and of both regular and voluntary observers, that it troubles us to realize that we are liable to be taken in by such unblushing deception. Mr. Smith kindly suggests that the tornado in question may have happened in the neighborhood of Jasper, Walker County, Ala. (or, possibly, Jasper, Pickens County, Ga.), but we fear that it is not worth our while to make further search after this will-o'-the-wisp.

Whenever similar inventions appear in the daily press, we should be glad to have the local voluntary observer communicate directly to us a refutation of the misleading statement, in order that such romances may not unwittingly be quoted as belonging to the annals of science.

THE PRACTICAL UTILIZATION OF LIGHTNING.

If the study of atmospheric electricity is of general interest to meteorologists, then they must take an equal interest in its practical application to the wants of man. Franklin wrested the thunderbolts from the heavens, but no one has yet harnessed them to useful work. The telegraph and the telephone, the electric light and electric motors, illustrate our control of artificially manufactured electricity, but the natural article in its native state is still a terror to man, or an annoyance. For a generation past there have been innumerable schemes for the use of ground currents in telegraphy and aerial currents in telephony. The daily press announces that quite recently an inventor at Worcester, Mass., has perfected mechanism by which he can actually discharge a bolt of artificial lightning and control its direction, and again, we are told that "several experimentors are already employed in devising a plan for gathering and storing atmospheric electricity which may be employed for lighting, heating, and motor power."

A still more hardy inventor of the highest scientific attainments has arranged a trap to catch electro-magnetic waves from the sun, or other heavenly bodies, and although he has caught nothing, yet the idea is still held to be scientifically correct.

The fact is, however, that the natural electric and magnetic forces at the earth's surface are so vastly inferior to the forces of gravitation and solar heat, wind pressure, waterfalls, and even tidal rise and fall, that man can not profitably experiment with natural electricity while these greater forces are running to waste.

MOUNTAIN STORMS.

Referring to Mr. Struble's article on "Peculiar Mountain Storms," in the MONTHLY WEATHER REVIEW for May, 1897 (Vol. XXV, p. 212), Mr. A. D. Elmer, voluntary observer at Northfield, Mass., states, under date of July 31, 1897, that—

> In the American Meteorological Journal for August, 1895, Vol. XII, p. 127, there will be found reprinted from the New York Tribune an account of local winds and clouds at New Lebanon, N. Y., which also may be considered as a perfectly reliable description of what obtains also at Northfield, Mass., under the same conditions, except that as the decline from the ridge of the eastern hills, over 1,500 feet above sea level, to the Connecticut River Valley, 200 feet above the sea, is less than the Taconic decline or the Laurel Hill decline in Pennsylvania, therefore the gale is not noticeable a mile from the mountain base, except in occasional gusts, and is not so strong at the base as to attract serious attention, not breaking limbs from trees, but manifesting itself from westward by a loud roar; otherwise the conditions in the three cases are practically identical, except, I think, by the "storm rarely reaching 6 miles west," Mr. Struble means the gale, etc., for the other manifestations of the general cyclone must present themselves there. As to explanation, it seems to me that as the chinook manifests itself in the same descending tendency, likewise the great guns of a West Indian hurricane, it may be assumed that all winds preceding a storm center, with falling barometer, represent air that is being forced down; therefore they flow down hill with accelerated velocity, similar to liquids, as water, etc. (Exception: When the increased temperature and lessened specific gravity of the storm current is sufficient to offset the pressure from above.) It is to be hoped that observations taken in the meteorological region—which is, strictly speaking, not less than the general height of clouds—will reveal the present mysteries in major part.

LANDSLIDE IN VERMONT.

We have received from Mr. W. A. Shaw, of Northfield, Vt., Weather Bureau Observer, an excellent manuscript map by E. J. Hatch, of Warren, Vt., showing the characteristics of the great landslide that occurred Wednesday, July 14. The previous landslide on record in this region is that of June 3, 1827, when about 100 acres slid from Fayston Mountain down to the valley beneath. The worst flood in the history of the valley was in July, 1830, and again July, 1850, and October, 1869. The landslide of the present month had been preceded by heavy rains, but it seems to have been started by the fall of an immense boulder near the top of the mountain in the northwest corner of Warren township at an altitude of about 3,890 feet. Simultaneously, another slide began at a point a little south of this boulder; the two slides joined together after a path of about 100 rods, and the com-